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Goodyear: A Renaissance Leaning Facade at Genoa

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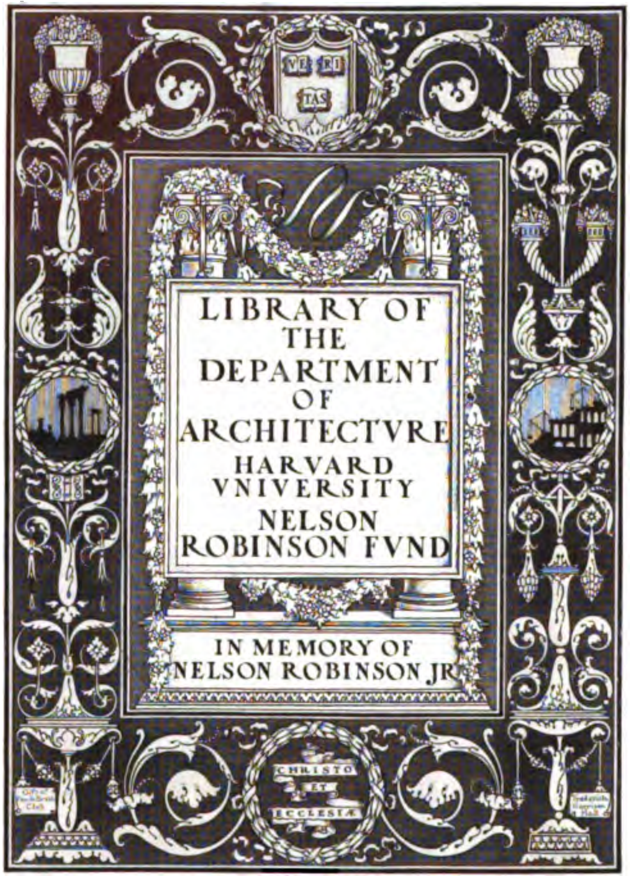

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MEMOIRS OF ART AND ARCHÆOLOGY

Vol. I: No. 1.

A RENAISSANCE LEANING FAÇADE AT GENOA

BY

WILLIAM HENRY GOODYEAR

WITH TEN HALF-TONE ILLUSTRATIONS AND THREE PLATES OF SURVEYS

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DEPARTMENT OF ARCHITECTURE,
LAWRENCE SCIENTIFIC SCHOOL,
HARVARD UNIVERSITY.

A RENAISSANCE LEANING FAÇADE AT GENOA.

IN several numbers of the Architectural Record magazine which appeared during 1896-7-8, announcements were made of surveys which have been carried out by the Brooklyn Institute of Arts and Sciences in various mediæval Italian churches and cathedrals. A summary account of the surveys was also published by the Brooklyn Institute in 1896, showing that hitherto unrecognized architectural refinements and subtleties are prevalent in many of these buildings.*

In the summer of 1901, these surveys in Italy were continued with important results. It had hitherto seemed probable that the mediæval architectural refinements, which had been discovered, had generally become extinct before the Renaissance, and the manner and cause of this mysterious extinction were one of the puzzling features of this study. In 1901, however, several instances of Renaissance survivals of the phenomena were observed. One of these is the case of a constructive leaning façade in the Renaissance church of S. Ambrogio at Genoa.

On the day of sailing from Genoa for New York in 1895 (after six months surveying work in Italy), a forward inclination of this façade was noticed, which appeared to be constructive. Among the various indications of constructive intention those at the southwest corner of the church are most easily described, because the side view is concealed on the southeast by an adjoining monastery.

At the southwest angle, as seen from the side (Fig. 1), the base courses, plinth, and mouldings were noted as level. On the other hand, the pilaster had a slight forward tilt, which appeared to be produced by masonry cutting. The front lower angle of each pilaster block appeared to be slightly obtuse, and the rear angle of each block appeared to be slightly acute (Fig. 1).

Of course, if the obvious lean (Fig. 3) had been due to settlement, then the base mouldings would have dipped downward toward the front.

There was no time, in 1895, to test these observations by the level. They were consequently not mentioned in an article which was published on constructive leaning façades in 1897; Architectural Record, Vol. VII., No. 3, "The Problem of the Leaning Tower of Pisa."

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*Illustrated catalogue of the Goodyear Collection of Photographs of Italian Architecture and of the Survey of Italian Mediæval Buildings. For a complete list of publications by the author of this paper on the subject of the Brooklyn Institute Surveys and on architectural refinements, see the third page of the cover.

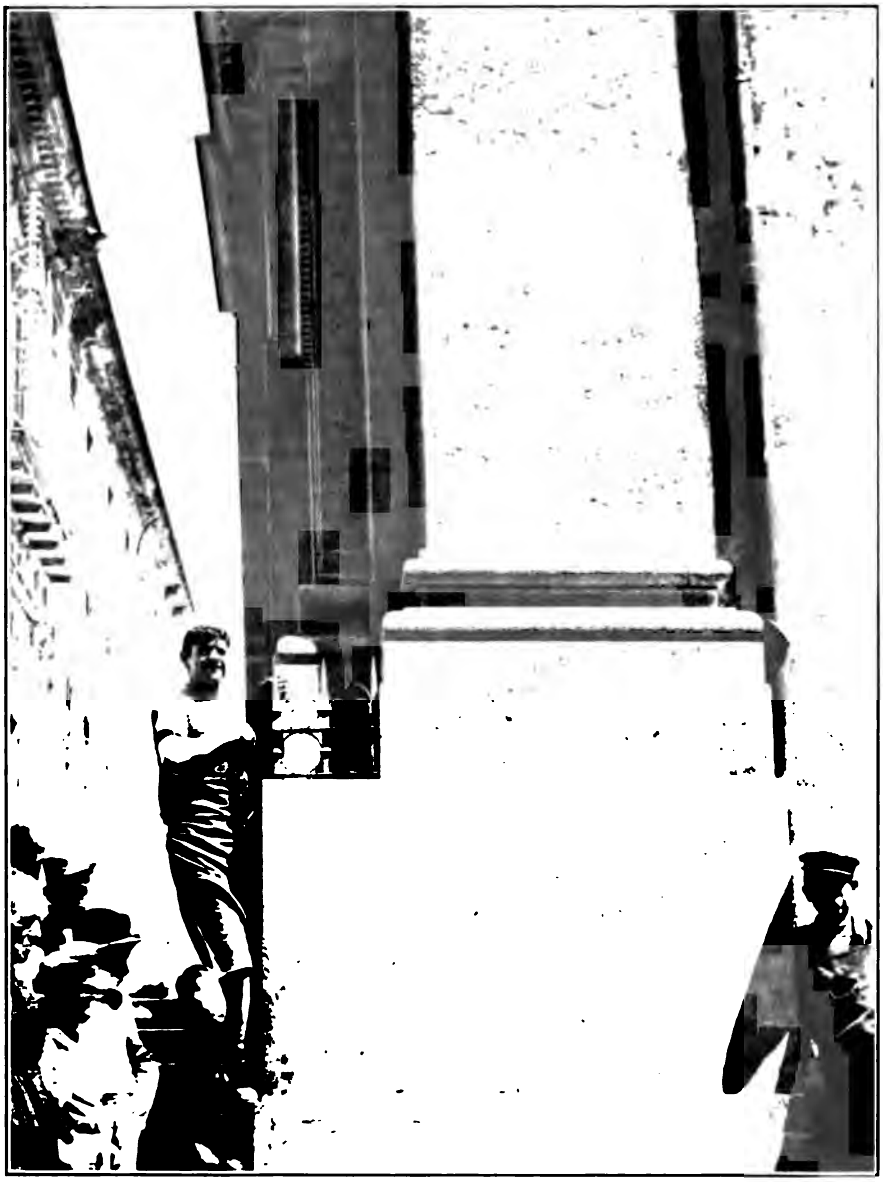

FIG. 1. THE LEANING FAÇADE OF S. AMBROGIO, GENOA.

Detail showing the oblique cutting of the angle pilaster. Photograph of the Brooklyn Institute Survey, 1901.

Reprinted from the American Architect, November 8th, 1902.

PROFESSOR GOODYEAR, of the Brooklyn Institute Museum, has been making an extremely interesting study of a Renaissance leaning façade, that of the church of S. Ambrogio, at Genoa, which was built in the latter part of the sixteenth century, and shows, in the lower story of the front, an inclination forward of about eight inches, the story above being vertical. That the forward inclination was intentional is shown beyond question by the fact that the return pilasters show base-mouldings perfectly horizontal, which form an obtuse angle with the front edge of the pilaster, and an acute angle with the other edge. This observation of Professor Goodyear, made in 1901, was subsequently confirmed by the official architect of the church, Signor De Andreis, who, it appeared, had noticed the inclination ten years before, on the occasion of certain repairs and alterations.

This discovery is of peculiar value, as confirming the results of Professor Goodyear's study of the Cathedrals of Pisa and Ferrara, and the churches of S. Ambrogio, at Milan, S. Michele at Pavia, and Notre Dame at Paris, the fronts of all of which have the lower portion inclined forward, although, in most of them, the walls above are vertical. It is interesting, also, to learn that the lower tier of columns adorning the front of St. Mark's Church at Venice lean forward about three inches, in a height of something over nine feet, although the wall behind them is vertical, as are also the columns of the tier above; while the Porta della Carta, in the courtyard of the Palace of St. Mark, leans forward as a whole, the inclination being about eight inches. The Porta della Carta is a work of the early Renaissance, or, at least, of the Transition, so that this, with the much later front of S. Ambrogio at Genoa, indicates that the practice of curving or varying lines and surfaces to correct the effect of perspective, or to give certain artistic qualities, was not confined to the architects of the Middle Ages, but persisted, in a certain degree, far into the Renaissance period.

The exact purpose of these variations from geometrical accuracy can only be conjectured. Undoubtedly, the practice of inclining forward the lower portion of the front of a building contributes to the peculiar advancing effect characteristic of many mediaeval churches, but whether this effect was aimed at, or whether the walls were inclined for some other purpose, we cannot say. In the case of S. Ambrogio at Genoa, and of the Porta della Carta at Venice, it is probable that the inclination was given to allow the sculptured detail to be seen more fully, and with less change from fore-shortening, just as the pinnacles and statues on the top of St. Mark's lean forward, the pinnacles overhanging more than six inches, and as friezes have been inclined forward, even down to our own time; but there is nothing in the lower portion of the front of Notre Dame, at Paris, which could be better seen in an inclined wall than in a vertical one, nor are the nine-foot columns of St. Mark's more favorably placed, in this respect, than they would be in a vertical position; so that we must, perhaps, conclude that the bulging effect was sought for its own sake, possibly as a correction of the flatness and dryness which the architects of the Middle Ages seem to have disliked so much.

Genoa was revisited a year ago, especially for the purpose of testing these observations. The fact of the lean proved to be too obvious for dispute. The only question to be settled was whether it was constructive. Having settled this point by the use of the level and by careful examination of the masonry, it seemed to be advisable to have the facts corroborated by an Italian expert.

The expert selected was the architect now in charge of the church, Signor Luigi De Andreis, who has high standing in Genoa as an engineering architect. His certificate follows here:

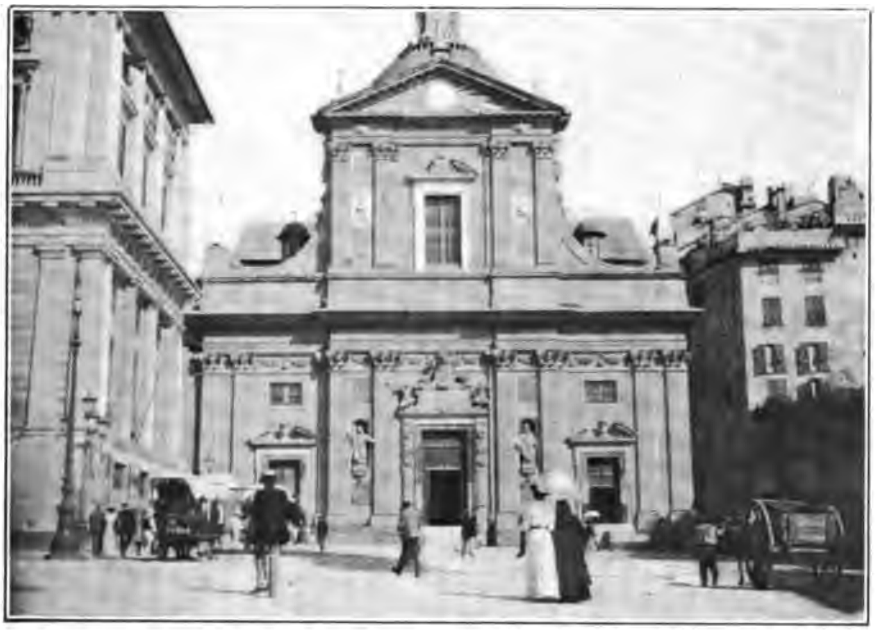

FIG. 2. S. AMBROGIO, GENOA.
General view of the Façade. Photograph of the Brooklyn Institute Survey, 1901.

Genoa, Piazza Invrea, 8. July 23, 1901.

Honored Sir: In accordance with your wish I now offer you some notes respecting the façade of the church of S. Ambrogio. This façade was constructed only in part, that is to say, in its lower half, near the end of the 16th century. Recently, in 1891, 1892, 1893, this existing portion was repaired, and the façade was finished by the addition of the upper portion.

While this work was going on the fact was ascertained that the lower part of the façade had a vertical inclination or lean of about twenty centimetres in a height of about fifteen metres.

The upper part was naturally built without any inclination. We cannot attribute the inclination of the lower part to the interior thrust of the arches or to any other cause of injury, since in that case there would have been partial distortions [of the masonry].

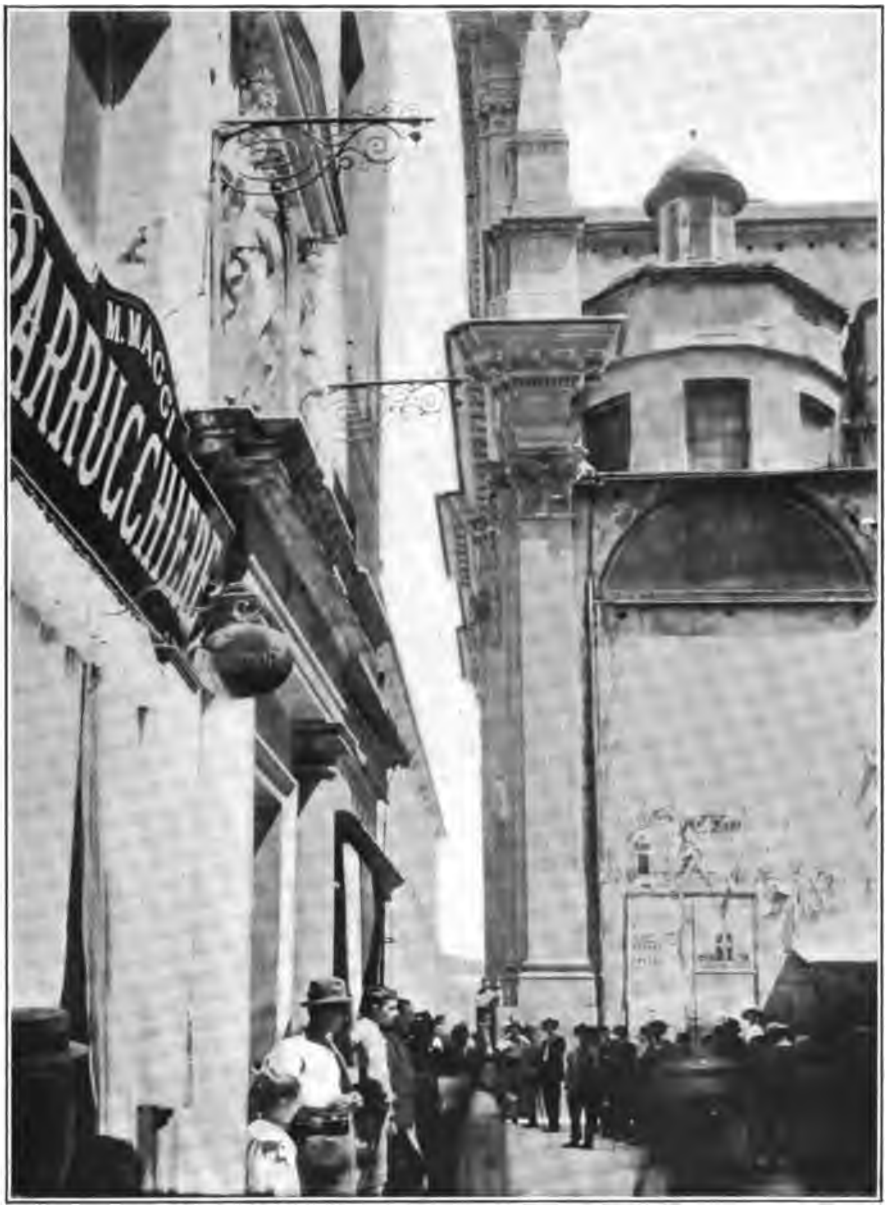

FIG. 3. THE LEANING FAÇADE OF S. AMBROGIO, GENOA.

The overhang is about 8 inches in 56 feet. Photograph of the Brooklyn Institute Survey, 1901.

On the contrary the given inclination is in a certain measure constant throughout the façade, while its decorations* are horizontal and not inclined in the direction of the lean. Hence it must be supposed that the façade was originally built with the aforesaid inclination.

Luigi De Andreis,
Architect directing the work on the façade.

The original Italian certificate is published in the Journal of the Archæological Institute of America, Vol. VI., No. 2, New Series. The facts being thus established their bearings have to be considered.

First, as to the purpose of this device, it can hardly have had any other than that of evading the effects of foreshortening. The same purpose which leads us, in hanging pictures, to tip them forward from the wall, would explain the wish of the architect to give the façade a slight forward lean. The same thing was done at an earlier date (15th century), with the pinnacles and statues on the top of St. Mark's façade at Venice, as attested by Commendatore Pietro Saccardo, who was in 1901 the engineering architect in charge of that church, and who observed this fact some years ago, as related in a later part of this paper.

The now vacant pedestal, 55 feet high, once belonging to a colossal statue of the Roman Marcus Vipsanius Agrippa, which stands before the Propylæa at Athens, on the left as one ascends the hill, has a very perceptible constructive forward tilt. The purpose of such an arrangement, especially in view of the approach from below, is self-evident. Vasari tells us, in his life of Michael Angelo, that this artist prepared the wall of the Sistine Chapel, on which he painted the Last Judgment, by giving it an additional coating, with a forward slope, amounting to one foot at the top. Vasari adds that this was done to prevent the settlement of dust, but it seems more likely that it was done to avoid foreshortening.

These various well-attested instances would enable us to understand the given device in the case of this Renaissance façade, and the instance of the Sistine Chapel offers a connecting link, as regards dates, with earlier cases.

This brings us to an interesting point connected with the date of the church and with its style. This date is comparatively recent, about 1590. And yet, although the architect was a Jesuit Father, the knowledge of his delicate device has not been cherished by the priests in charge of the church, and this knowledge has wholly disappeared in Genoa.

It is interesting to discover a certified case of a leaning façade of which the traditional memory has disappeared within the limits of modern history; since the year 1600, since the invention of printing and since the rise of literary record regarding architecture. Such an instance makes it easier to understand the disappearance of such traditions before printing, and before the literary record of architectural science was practiced.

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*Meaning the base mouldings.

Another phase of this matter is that of style. S. Ambrogio, at Genoa, stands on the border of the late Renaissance style. The great rarity of such cases within the limits of the Renaissance period is undoubted. It is doubtful if there is another Renaissance leaning façade in Italy. This is, so far, the only country in which our search for such phenomena has been systematic or widely extended, and consequently the only country of which I can speak

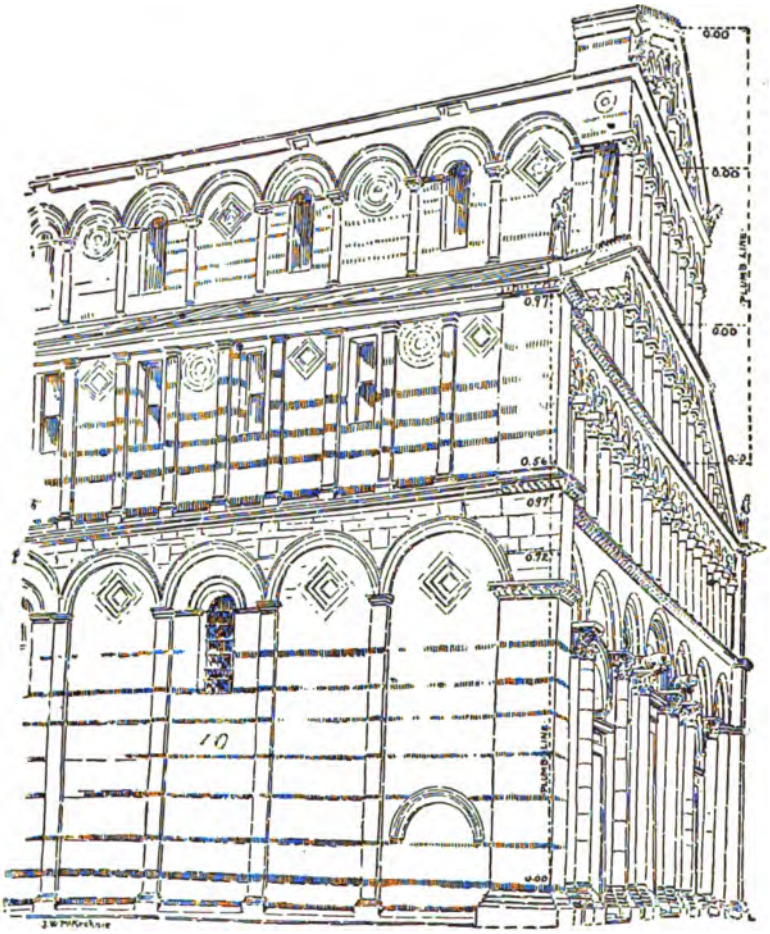

FIG. 4. THE LEANING FAÇADE OF PISA.

Republished from the Architectural Record, Vol. VII., No. 3. Measurements in foot decimals are entered on the drawing. The entire amount of the inclination is about 17 inches, with a return to the perpendicular in the three upper galleries. Tracing from a Brooklyn Institute photograph. See also Figs. 5 and 6.

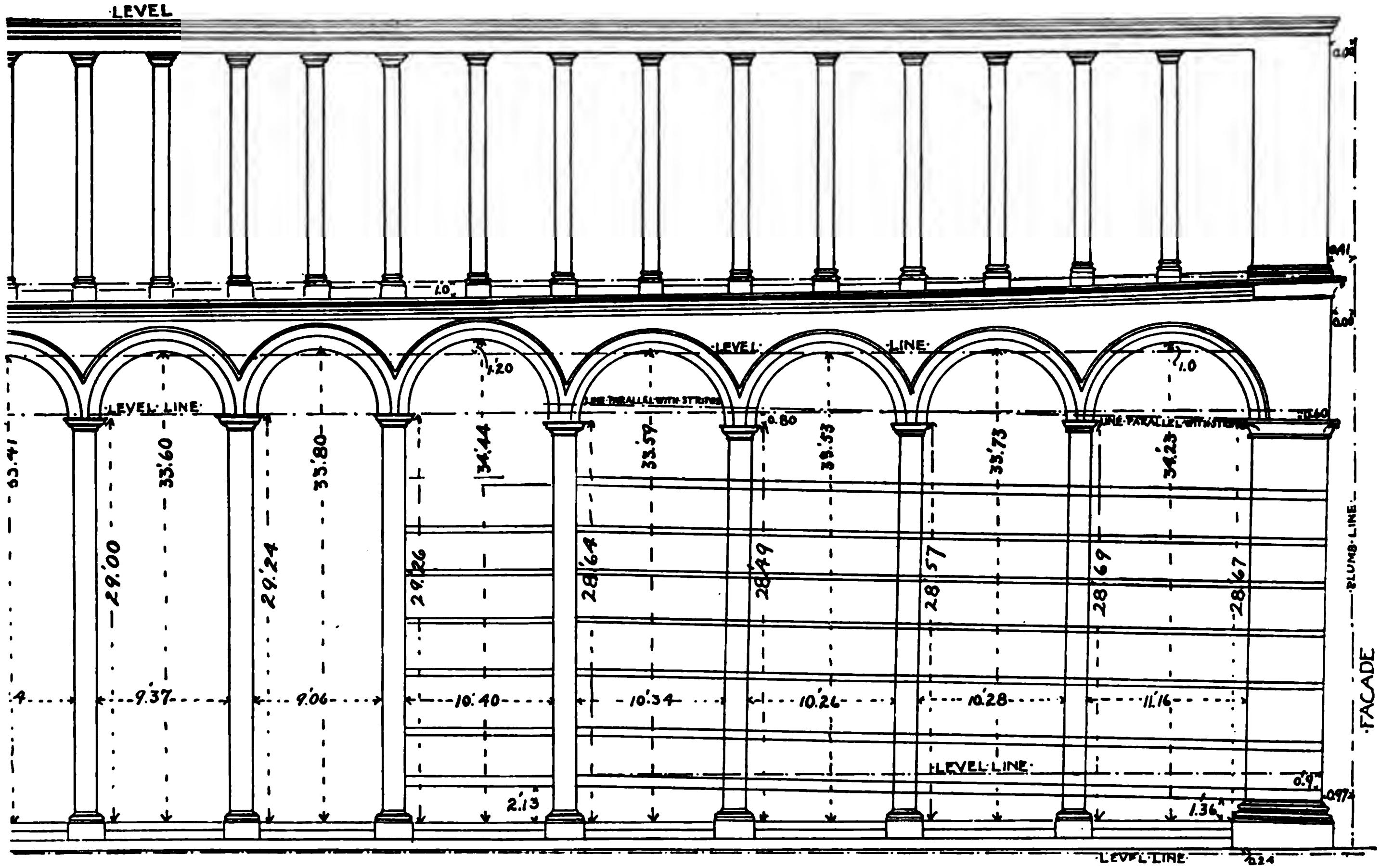

FIG. 5. SURVEY OF THE NORTH CATHEDRAL WALL AT PISA, NEAR THE FAÇADE.

The measurements and levels show that the bend of the masonry stripes and the connected inclination of the façade are constructive. Measurements in foot decimals. Brooklyn Institute Survey of 1895. Republished from the Architectural Record, Vol. VII., No. 3.

at present with much security. It may, however, be considered probable that this is the only Renaissance instance in Europe.

In the articles which have been published on the mediæval phenomena it has been pointed out that they dwindle and become minimized in amount in the later Middle Ages; i. e., that they did not disappear suddenly. We are led back to this fact by the discovery of an apparently isolated case of a Renaissance leaning façade, because it is always easier to understand a gradual fading away of a traditional practice than it is to conceive of its sudden disappearance.

Leaning façades were certainly not numerous in Italy at any period. Careful search in a very large number of Italian towns, and including all of the generally quoted and better known churches of Italy, has revealed the following instances:

That of the Pisa Cathedral is the most remarkable (Figs. 4, 5, 6) on account of the abundance of evidence in the masonry cutting for the constructive intention. It was originally announced by me as a constructive leaning façade in 1874* on the strength of observations made in 1870. The evidence was strengthened to the point of absolute certainty by the surveys of 1895.† In 1901 this evidence of the published surveys was presented to Signor Annibale Messerini, the engineering architect now in charge of this cathedral. He examined the building with me, and his certificate is appended here.

The original Italian certificate is published in the Journal of the Archæological Institute of America, Vol. VI., No. 2, New Series. This certificate also covers other announcements concerning the Pisa Cathedral, which are found in the various articles which were published in 1896-7-8, in the Architectural Record:

Pisa, August 9, 1901.

Honored Sir: I have examined your measurements of the monuments of Pisa and am able to say that the proofs are complete for the following facts:

1st.—That the façade of the Pisa Cathedral was intentionally inclined in the original construction.

2d.—That all the curves of this building, both the horizontal and the vertical, were intentionally made in the original construction.

3d.—That the oblique lines of the interior galleries were built as they now appear.

4th.—That the main exterior cornice is oblique by construction.

With assurance of high regard,

Annibale Messerini, Engineer.

[Architect in charge of the Pisa Cathedral.]

The whole overhang of the Pisa façade is 17 inches, but it does not project beyond the forward edges of the great plinth blocks at its angles.

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*"Scribner's Magazine," Vol. VIII., No. 4, 1874.

†Architectural Record, Vol. VII., No. 3, "The Problem of the Leaning Tower of Pisa," 1898.

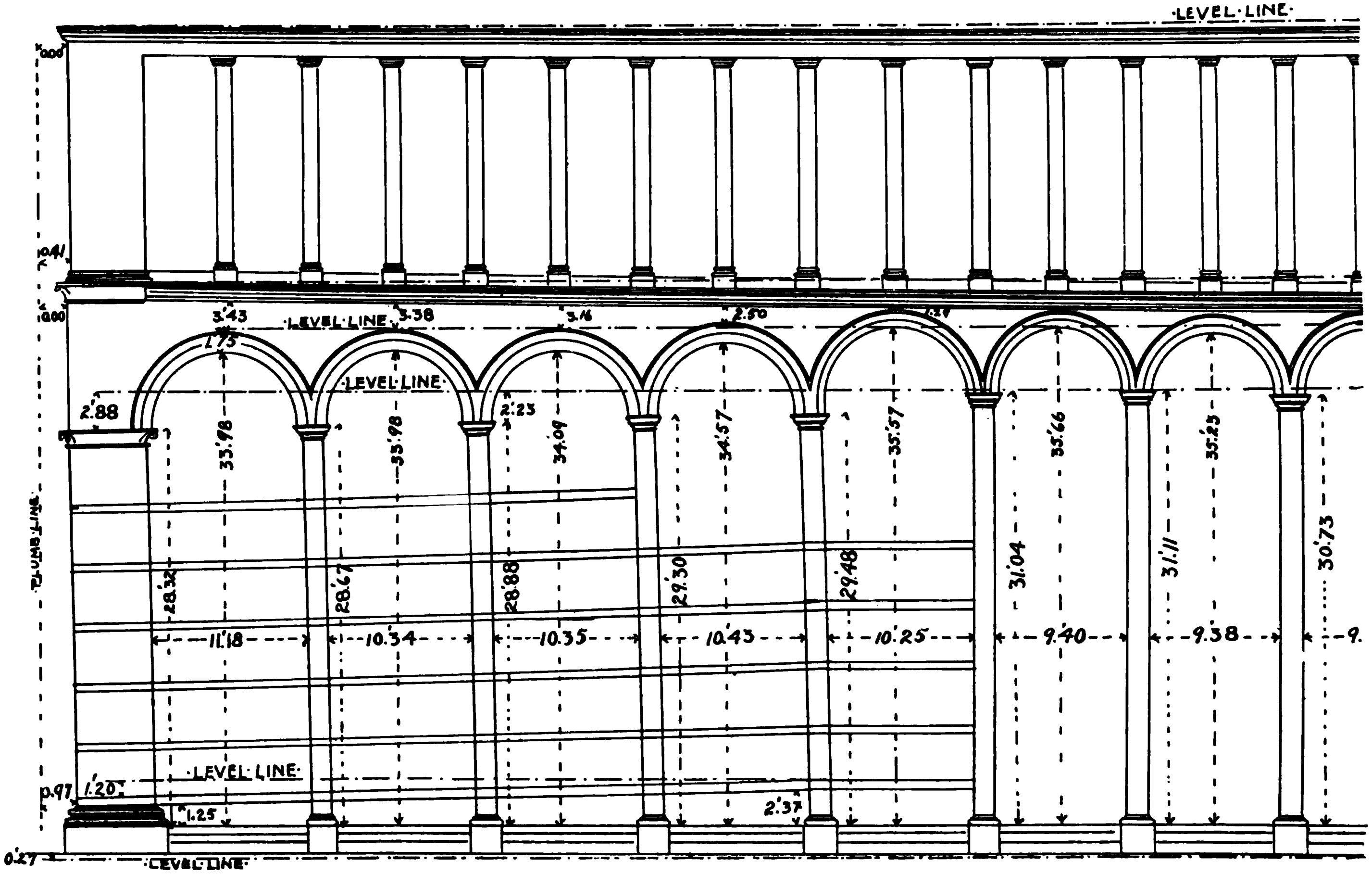

FIG. 6. SURVEY OF THE SOUTH CATHEDRAL WALL AT PISA, NEAR THE FAÇADE.

The measurements and levels show that the bend of the masonry stripes and the connected inclination of the façade are constructive. Measurements in foot decimals. Brooklyn Institute Survey of 1895. Republished from the Architectural Record, Vol. VII., No. 3.

It straightens back to the perpendicular in the three upper stories. The third story (second gallery) only tips forward a tenth of a foot, and the two upper stories are perpendicular. This peculiarity of a return bend to the perpendicular is shared by the leaning façades of S. Michele at Pavia (Figs. 7 and 8) and of S. Ambrogio at Milan (Figs. 9 and 10), both of which are undoubtedly constructive. The return curve of S. Ambrogio is shown by Fig. 9, but the return curve of S. Michele (Fig. 8) is mainly above the limits of the photograph. It may be noticed on the left of the picture at the top. An enlargement of the negative up to 25″ × 35″, now in the Brooklyn Institute Museum, shows the beginning of the curve quite clearly.

As regards the constructive facts in S. Michele at Pavia, a photograph taken in 1901 is very effective (Fig. 7). It shows an upward tilting of the base courses. These mouldings would dip downward, if the façade had settled.

In Fig. 9, the return curve of S. Ambrogio at Milan is shown from the inside of the portico (second story) as being against thrust. As the return curve is constructive, of course the lean must be the same (Fig. 10). This lower façade thrusts against court arcades of the same date and is supported by them. The capitals of the piers have been observed as horizontal, although the picture does not show this. If the façade had settled, the tops of the capitals would dip downward. There is also conclusive evidence in the masonry cutting so far unpublished.

Notre Dame at Paris offers another instance of a front which leans out below and then straightens to the perpendicular (by an offhand change of direction, not by a curve). The inclination does not extend above the first story, and is roughly estimated to be about nine inches. Those who examine this façade in Paris should be careful to notice that the buttress masonry at the lower part of the northwest angle is a modern repair, and here the lean has been obliterated.

The facts regarding Notre Dame were hastily observed during the Paris Exposition of 1900. They were published in the Journal of the Archæological Institute of America, Vol. V., No. 1., New Series, 1901.

The leaning façade of the Ferrara Cathedral has already been noticed and illustrated in the Architectural Record.* This is the one important mediæval instance, so far observed, which shows a continuous forward lean (Fig. 11), as distinct from a return bend. There are no partings of the masonry on the sides, such as would have occurred if the foundations of the building had yielded. The amount of this lean appears to be about 22 inches in about 96 feet.

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*Vol. VI., No. 1, p. 8; Vol. VII., No. 3, p. 287.

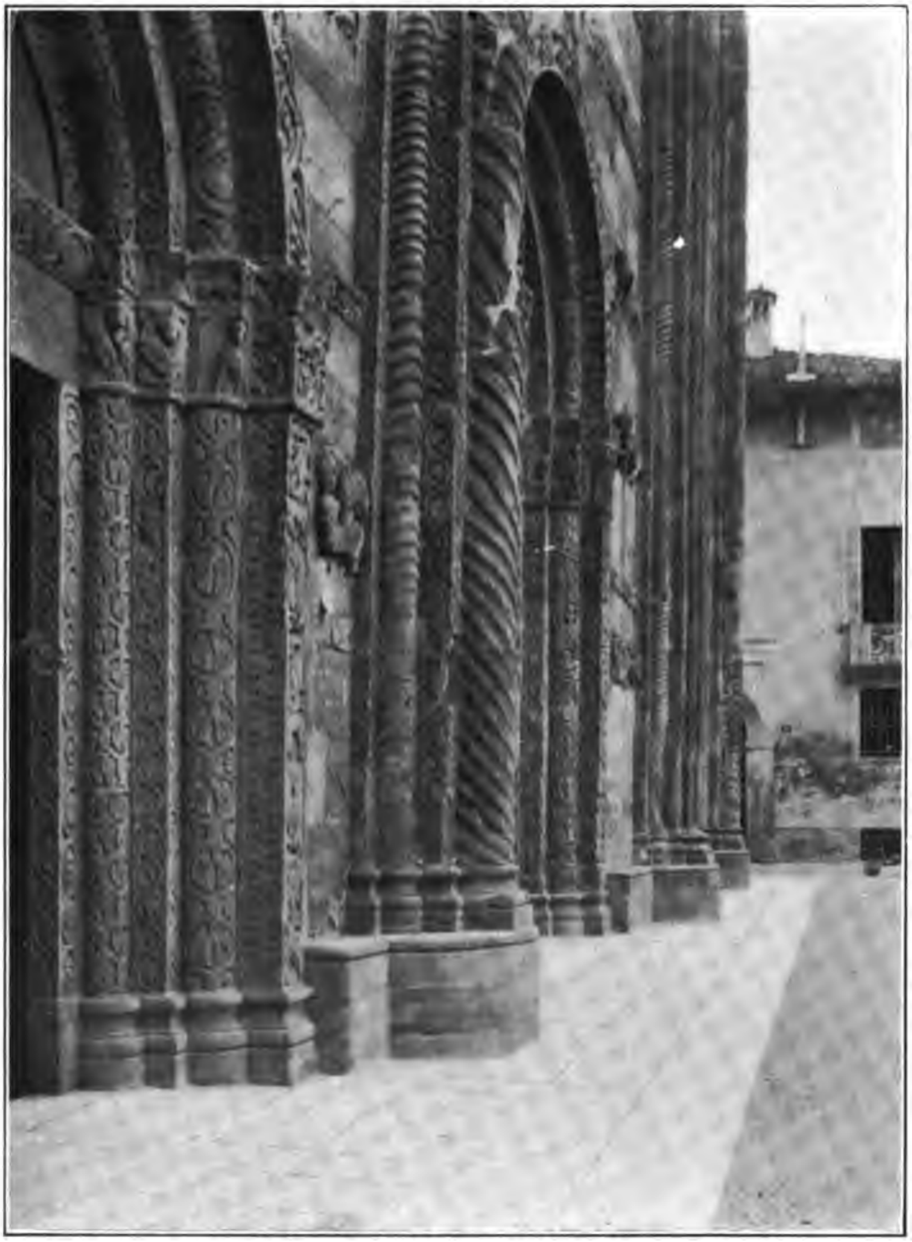

FIG. 7. THE LEANING FAÇADE OF S. MICHELE, PAVIA.

Detail showing the upward tilt of the plinth mouldings. Photograph of the Brooklyn Institute Survey, 1901.

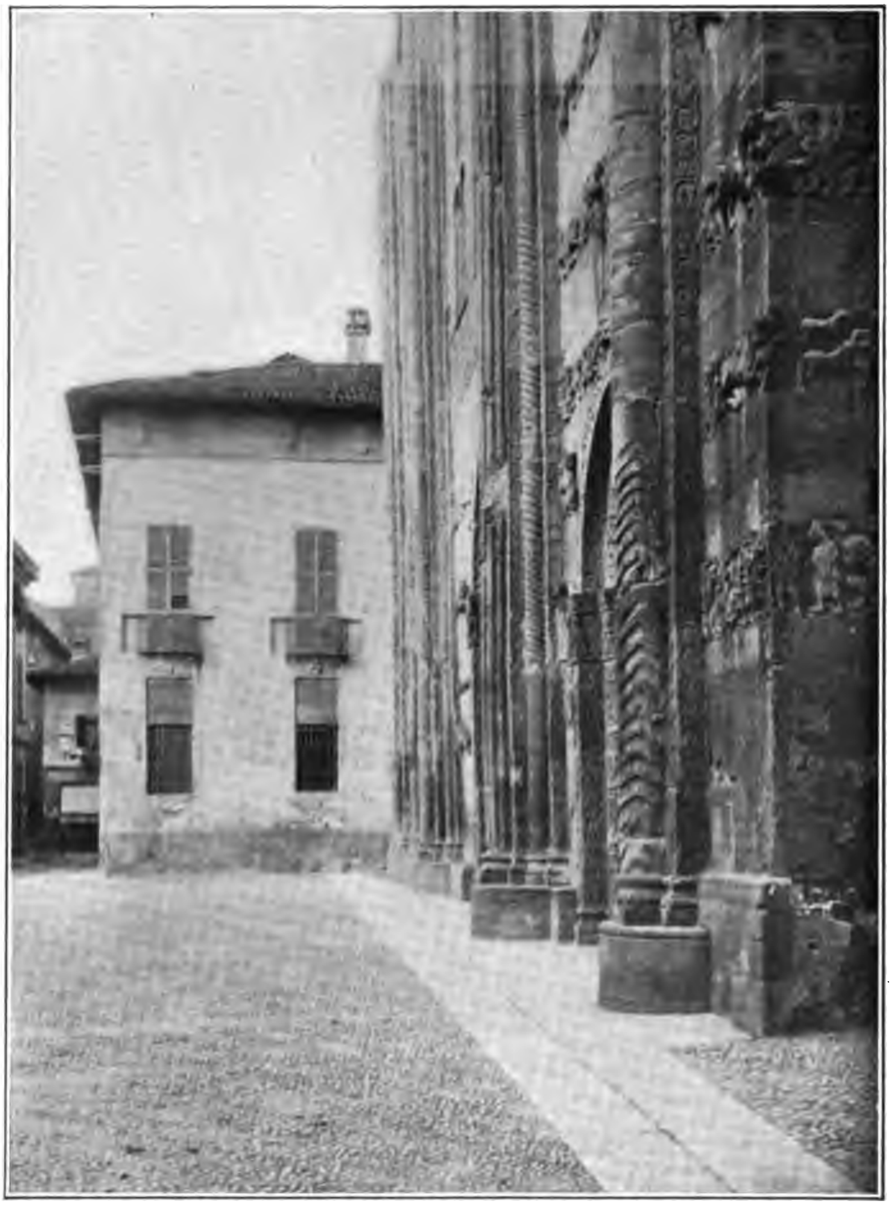

FIG. 8. THE LEANING FAÇADE OF S. MICHELE, PAVIA.

The inclination is about a foot, with return bend to the perpendicular, which shows slightly on the extreme left. Photograph of the Brooklyn Institute Survey, 1901.

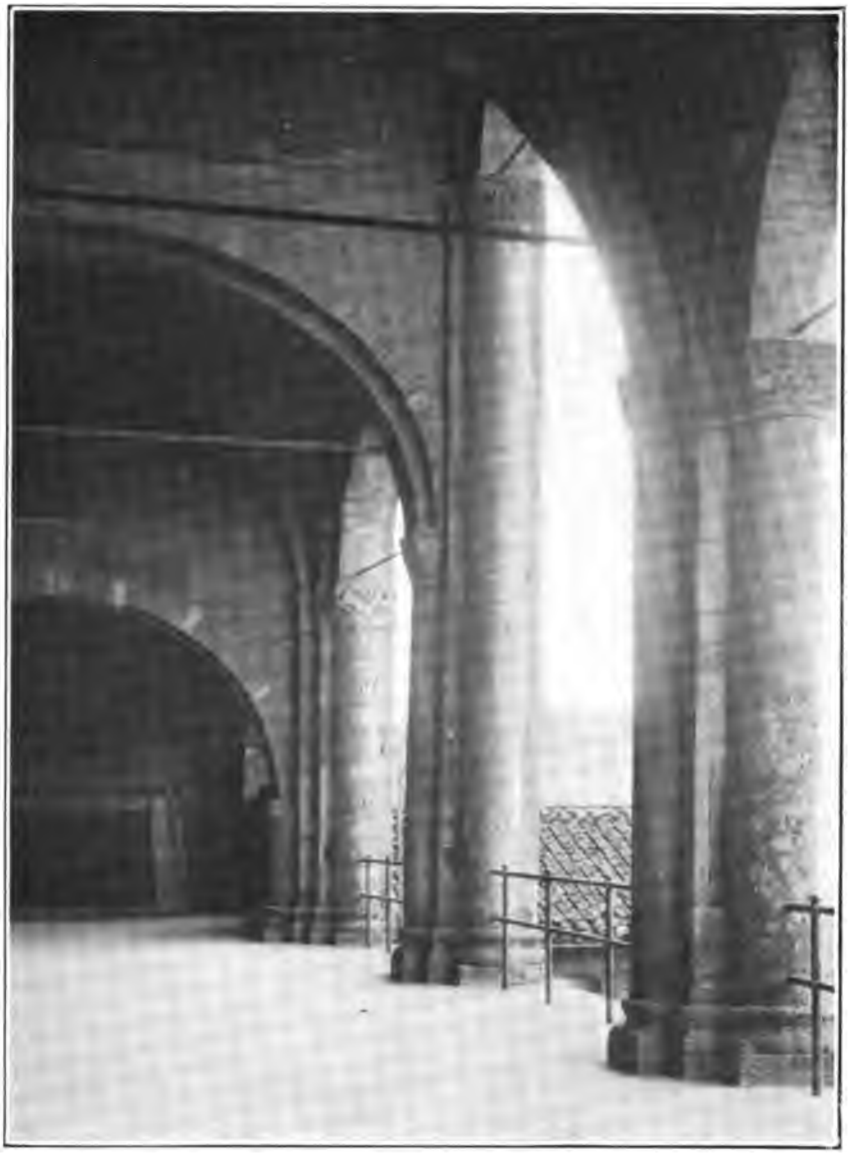

FIG. 9. RETURN CURVE OF THE LEANING FAÇADE OF S. AMBROGIO, MILAN.

Taken inside the portico of the second story. Photograph of the Brooklyn Institute Survey, 1901.

Thus we are able to quote, so far, four important mediæval instances, in Italy, of which three are certainly impregnable, and I have, personally, no doubt about Ferrara.

On the other hand, there are three leaning façades in Italy which must be considered as probably accidental. In the Cathedral of Volterra the south wall has bulged out so far, that it had to be supported by a building which was erected against it. This fact casts suspicion on the constructive intention of the leaning façade at Volterra, although there is, on the face of things, no reason why a building which was constructed with such a refinement should not also have met with an accidental mishap. There is a concave curve in plan in one of the upper faces of the Parthenon, which has been attributed by Penrose to the explosion which ruined the building. This has never been held by Penrose, or by others, to cast doubt on the existence of constructive curves in the Parthenon.

Two other doubtful cases are those of S. Pierino at Pisa and of S. Simone Juda at Lucca. The façade of the Madonna dell'Orto at Venice is very probably a good constructive instance. There is nothing to discredit it, excepting the fact of its being in Venice, where the foundations of buildings are supposed, without very good reason, to be peculiarly unstable. This façade curves back to the perpendicular, and this alone seems to establish constructive purpose. The observations of this church (in 1895) were rather hurried, and no plumbs were taken, so that for the present it must be considered as an undetermined case.

In 1901 I re-examined the small church of S. Giovanni e Paolo at Bologna, which is mentioned in the Architectural Record, Vol. VII., No. 3, p. 286, and determined that the lean was too slight for quotation. A hasty observation of S. Agostino at Cremona, made in 1895, has been mentioned on the same page of the Architectural Record. This church has not been revisited.

Some additional observations of 1901 for constructive leaning faces, are important, although they do not concern façades.

In the church of S. Francesco at Arezzo, where the choir is recessed, the walls on each side of the choir, fronting the nave, have a strong forward constructive slope. These walls had fresco decoration. A close analogy with the wall of the Sistine Chapel, above quoted, may be suggested for this instance.

The exterior of the choir of the Cathedral of Palermo leans out very remarkably at the cornice, apparently in order to evade the foreshortening of the fine decoration which is there applied. The choir of the Pisa Cathedral leans out as much as the façade, and also straightens to the perpendicular in the upper story. The upper part of the façade of S. Frediano at Lucca curves forward almost as much as an Egyptian temple cornice. It has mosaic deco-

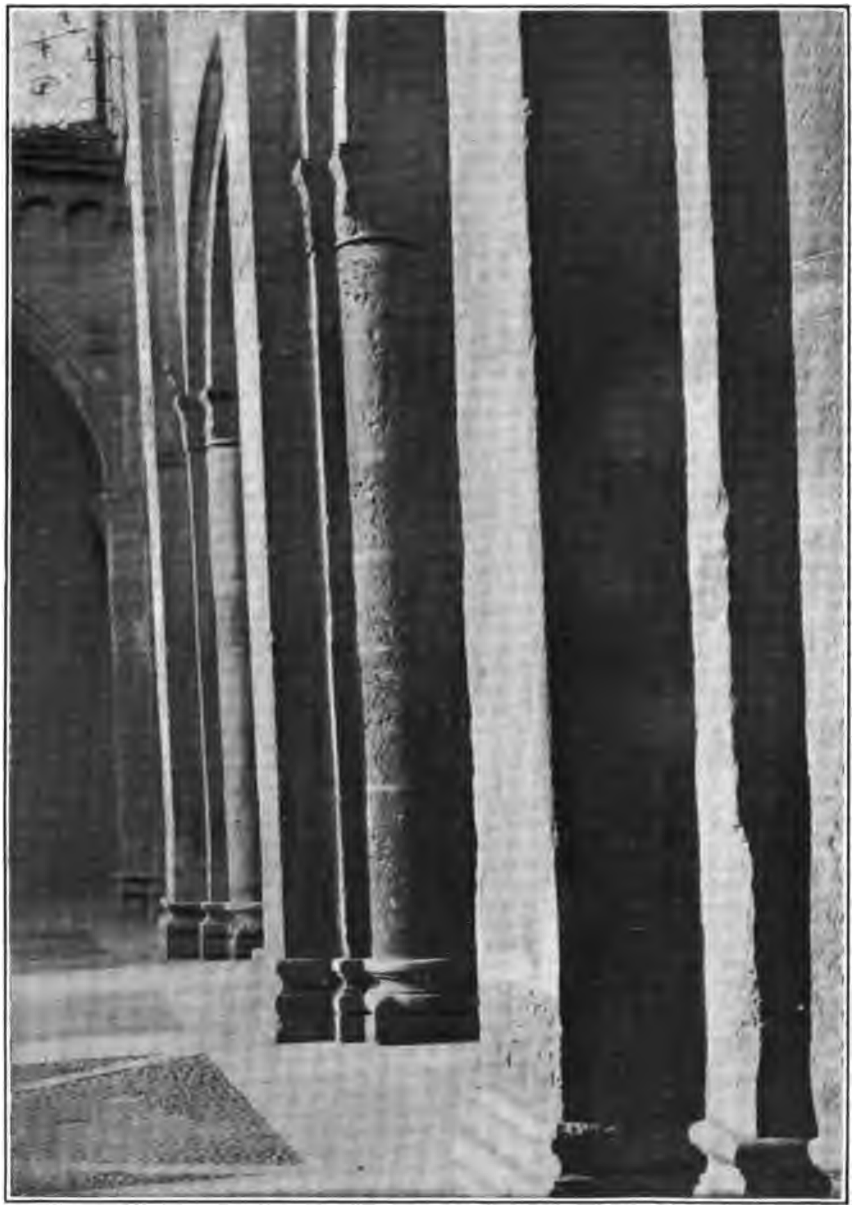

FIG. 10. THE LEANING FAÇADE OF S. AMBROGIO, MILAN.

The lean amounts to 9 inches for the first story. Photograph of the Brooklyn Institute Survey, 1901.

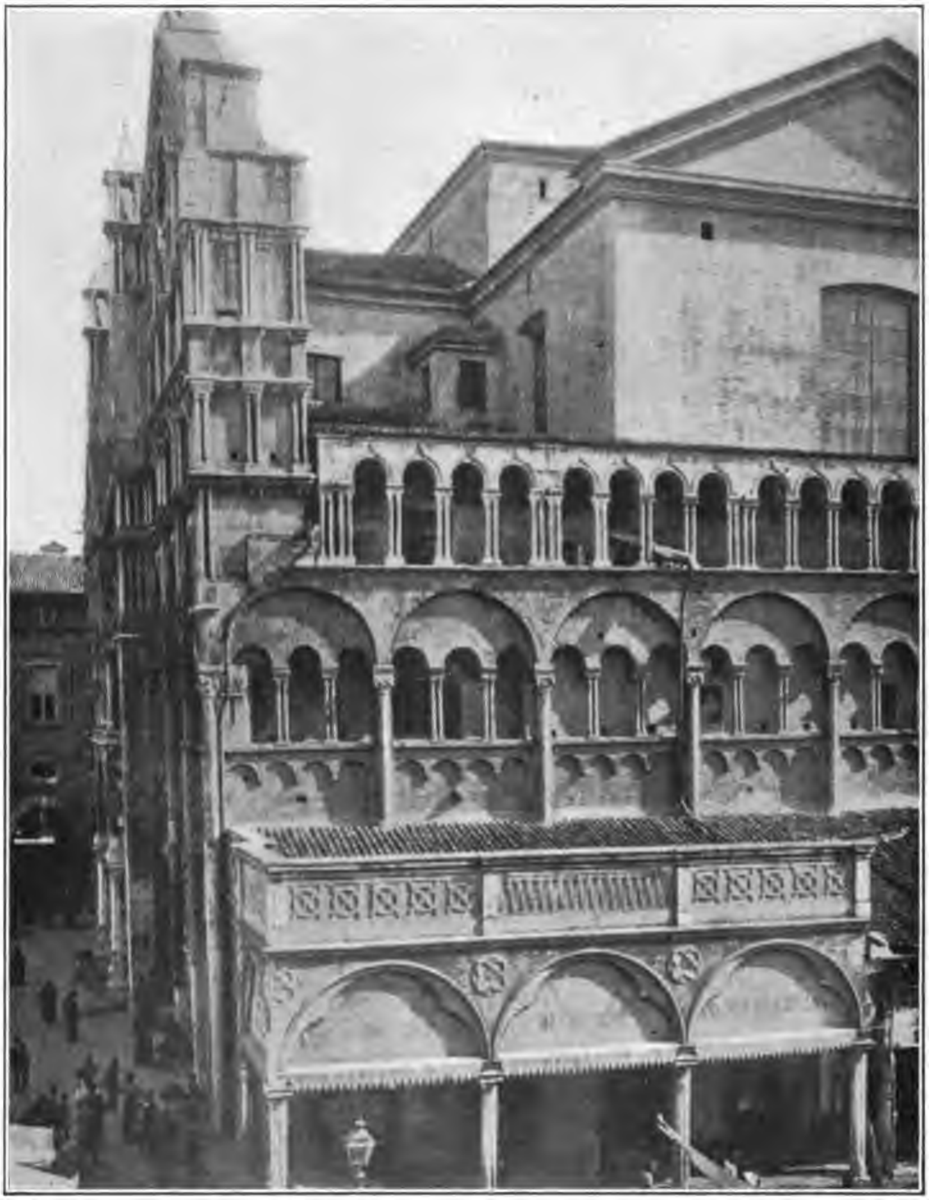

FIG. 11. THE LEANING FAÇADE OF FERRARA.
The lean amounts to about 22 inches in 96 feet. Photograph of the Brooklyn Institute Survey, 1901.

ration, and the avoidance of foreshortening was palpably intended. The instance to be finally mentioned is among the most important, because the constructive facts are now attested by an architect's certificate and because they have been so long ignored in the case of a church as famous as S. Mark's at Venice.

This instance was first observed in 1870, and was again observed in 1895. Publication was made in Vol. VII., No. 3, Architectural Record, but with a very unsatisfactory photograph. Four photographs were made in 1901, all of which show the plumb line. Figs. 12 and 13, are selected from them.

All the columns of the façade of S. Mark's on the lower story, lean out in similar fashion, excepting those at the southwest angle, which have been repaired by an architect now deceased, and ignorant of this refinement. The plumbs show tips varying from 2¼ to 3½ inches in a height of 9½ feet. The walls behind these columns are perpendicular. The columns of the upper row are perpendicular.

When these facts were pointed out, in 1901, to Commendatore Pietro Saccardo, the engineering architect then in charge of S. Mark's, he instantly recognized them as constructive, although he had not previously noticed them. He also furnished me with a certificate regarding the construction. This certificate is reserved on account of its inclusion of other phenomena, and will shortly be published in Vol. I., No. 2, of these Memoirs.*

Although in this instance it is the columns which lean forward and not the wall, the facts are analogous to those shown by the bending or curving fronts of Pisa, Pavia and Milan. There is, however, this distinction. If the avoidance of foreshortening were the only consideration here, it would seem that the upper row of columns would also lean out. At Pisa, Pavia and Milan, and in Notre Dame, we might suppose the return to the perpendicular to be due to considerations of stability, but this consideration could not be imagined to apply to the façade columns of the second row in S. Mark's, because there was no sacrifice of stability in the tilt of the lower columns; the wall itself being perpendicular. The bend in the vertical would therefore appear to have been the controlling consideration, in this instance, and an aversion to the rigidity of the straight line would therefore be the proper explanation. This may consequently also apply to the cases at Pisa, Pavia and Milan.

This probability is strengthened by the interesting observation of Commendatore Pietro Saccardo, as to the forward tipping pinnacles and statues of St. Mark's, and as to the forward tip of the Porta della Carta. Since the pinnacles tip by construction the perpendicular position of the second line of columns on the façade must be certainly significant of the preference for a bending vertical at that point. Otherwise they would also tip forward. On the other hand, the forward tip of the pinnacles and statues could only be explained as intended to avoid foreshortening. This must also be the explanation for the Porta della Carta.

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*The original has been published in the Journal of the Archæological Institute of America, Vo. VI., No. 2. New Series.

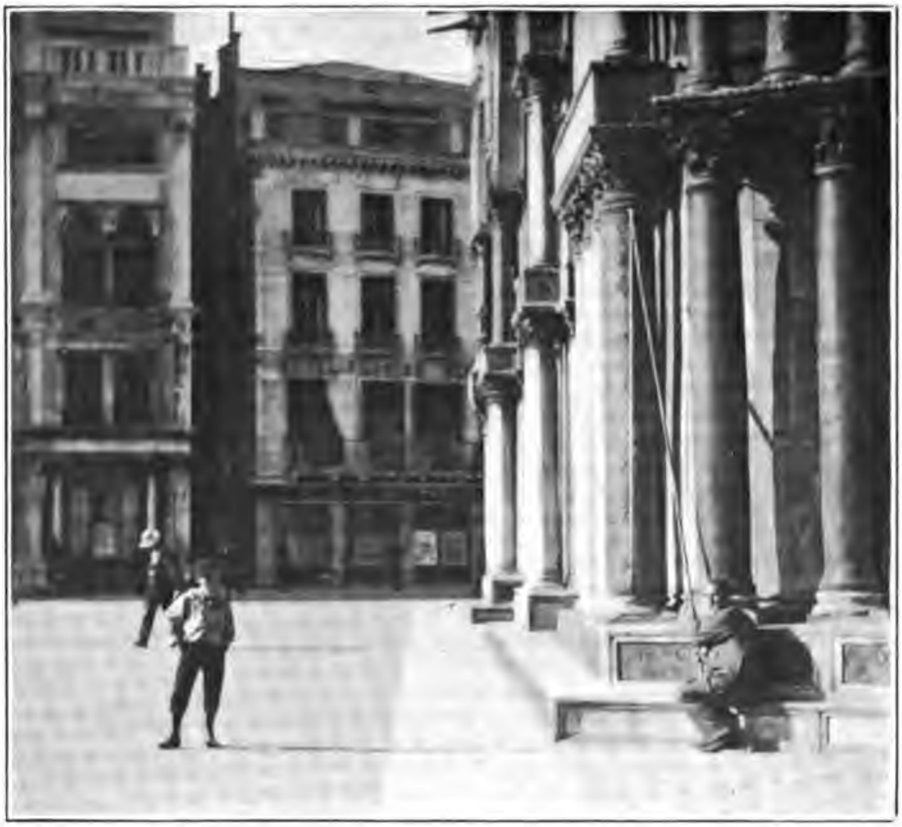

FIG. 12. THE LEANING COLUMNS OF S. MARK'S FAÇADE, VENICE.

The leans vary from 2¼ to 3½ inches in a height of 9½ feet. The upper columns are perpendicular, as is the wall behind the leaning columns. Photograph of the Brooklyn Institute Survey, 1901.

The forward tip of the pinnacles was personally made known to me by Commendatore Saccardo as being about 6½ inches. We plumbed the Porta della Carta together, and found the tip to be 8 inches.

The fact that the architect, now deceased, who formerly controlled the repairs of S. Mark's did not understand, and did not repeat, the artifice of the original builders during his repairs was mentioned to me by Commendatore Saccardo. He also informed me

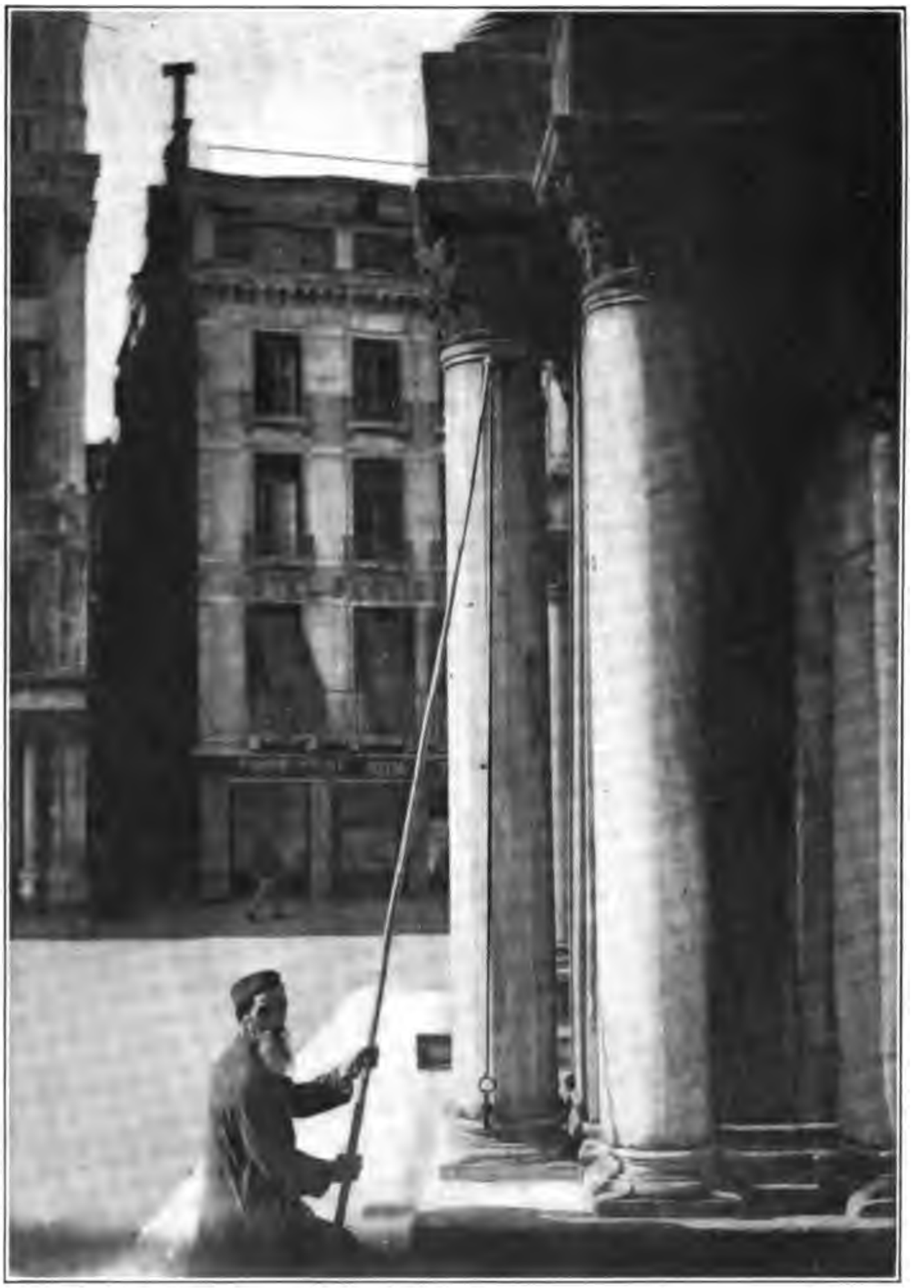

FIG. 13. THE LEANING COLUMNS OF S. MARK'S FAÇADE, VENICE.

The leans vary from 2¼ to 3½ inches in a height of 9¼ feet. The upper columns are perpendicular, as is the wall behind them. Photograph of the Brooklyn Institute Survey, 1901.

that he was at this time a subordinate of the official in question, and that a controversy between them was caused by his contention that the repairs of the side façades had not been carried out according to the methods of the ancient builders. This controversy was carried into the Venetian daily newspapers and continued for ten days (1881). An account of this controversy will be found at p. 5 of a monograph by Commendatore Saccardo, entitled, "I Restauri della Basilica di San Marco nell' ultimo decennio," (Venezia, Tipografia Emiliana, 1890).

We now return to the consideration of the leaning façade of S. Ambrogio at Genoa, with the following conclusions:

(a) If the tradition regarding such a practice disappeared, as it did disappear, after 1600, there is no reason why the tradition should not have disappeared, for earlier buildings, such as the Pisa Cathedral; and one ground of incredulity regarding mediæval instances, viz.: the supposed unprobability that such a thing should have been done and then forgotten, no longer exists.

(b) The suggestion has sometimes been verbally made that the builders of the Middle Ages were not familiar with the ordinary mechanical methods of rectilinear building, but the builders of the late Renaissance have never been accused of lacking in formal accuracy. Therefore, if they did, for a purpose, deviate from the normal perpendicular, in one instance, there is no reason why the builders of the Middle Ages should not have deviated from the normal perpendicular, for the same purpose, or for some other purpose, in other instances. In fact, the isolation of the Renaissance example can best be explained as a rare survival of a practice which once had greater currency. It is especially for this reason and as bearing on the announcements which have been previously made for mediæval buildings that this paper is published.

Museum of the Brooklyn Institute of Arts and Sciences.
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